

GRADUATE STUDENT CLIMATE ADAPTATION PARTNERS (GRADCAP) WEBINAR SERIES



TEMPERATURE EFFECTS ON THE SURVIVAL AND GROWTH OF FARMED ATLANTIC SURFCLAMS

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The Atlantic surfclam (*Spisula solidissima*) is vulnerable to high temperature conditions – an issue that will be exacerbated as the Northeast’s coastal waters continue to warm.

We determined the optimal rearing temperature for juvenile surfclams and are currently studying whether heat-tolerance is a trait that can be selected for in future surfclam breeding programs. Throughout much of the Northeast, shellfish aquaculture is dominated by only two species: the hard clam (*Mercenaria mercenaria*) and the Eastern oyster (*Crassostrea virginica*). As the industry expands, local shellfish farmers have expressed interest in culturing new species. The Atlantic surfclam (*Spisula solidissima*), a native and fast-growing species, has potential to become an attractive alternate crop for farmers interested in diversification. However, the surfclam is vulnerable to high temperature conditions – an issue that will be exacerbated by climate change. The most recent evidence suggests the Northeast’s coastal waters are warming 2-3x faster than the global average. We investigated the effect of rearing temperature on juvenile surfclam survival and

growth. Our results suggest the optimal rearing temperature for juvenile surfclams is 20° C (68° F). Survival decreased as temperature increased (Figure 1A), but growth was greatest at intermediate temperatures (Figure 1B). Unfavorably warm water can cause severe mortality, yet juvenile surfclams can cope with short-term exposures to these stressful conditions. Since each surfclam cohort tested in the experiment responded somewhat differently to the rearing temperatures (Figure 1), we have also begun assessing surfclam heat-tolerance through selective breeding. Heat-selected and random-control surfclam brood stock groups will be generated and the heat-tolerance of each group’s offspring will be compared. Our data suggests that the Northeast’s ambient seawater is currently sufficient for surfclam seed production at commercial scales. For more information, view the publication online for free: <https://doi.org/10.1016/j.aqrep.2018.100176>

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FIGURE 1. Final survival (A) and growth (B) of early juvenile Atlantic surfclams (*Spisula solidissima*) 18° C = 64° F; 20° C = 68° F; 23° C = 73° F; 24° C = 75° F; 26° C = 79° F.

